Vol. 3 December 1939 No. 4

The EXTENSION ENTOMOLOGIST

The annual report in the commercial world shows whether the enterprise operated at a profit or a loss. In extension work the answer is not so obvious. Sometimes a monetary value cannot be placed on extension work. Nevertheless, there is always some thing on which we have worked that has a definite money value, and this should be cited along with the many attainments that express themselves in terms of "practices adopted," "a more satisfied people," or "for the good of the general public."

The annual report is almost the only avenue for informing others in the Extension Service of your accomplishments, except to those who are close to your work, and for this reason it should be prepared in a way that will do justice to your work.

A Suggestive Outline for the Annual Report of Subject-Matter Specialists has been prepared for your information and guidance. Other suggestions may also be gathered from the excerpts appearing in this and earlier issues of The Extension Entomologist.

M. P. Jones
Extension Entomologist

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE AND
EXTENSION SERVICE, COOPERATING

CONTENTS

ANNOUNCEMENT OF MEETINGS

December 27-30, 1939. - Meeting of the American Association of Economic Entomologists of the American Association for the Advancement of Science; Deshler-Wallick Hotel, Columbus, Ohio.

February 7, 8, and 9, 1940. - Meeting of the Cotton States Branch, American Association of Economic Entomologists, Tutwiler Hotel, Birmingham, Ala.

February 14, 15, and 16, 1940. - Meeting of the Texas Entomological Society, Reese-Wil-Mond Hotel, Harlingen, Tex.

March 21-22, 1940. - North Central States Entomologists' Conference, Union Building, Purdue University, La Fayette, Ind.

PERSONNEL CHANGES

Ames, Iowa. - On September 15, Dr. H. D. Tate resigned as extension entomologist in Iowa and took up his duties as associate professor of entomology at Lincoln, Nebr. Dr. Tate's work will consist of research to a considerable extent, but along with it he will do some teaching.

NEWS NOTE

Mr. T. H. Parks, extension entomologist in Ohio, spent July 1 to November 1 on leave visiting 21 Midwestern and Western States. He was interested primarily in visiting the entomological research stations and extension services in these States. During this trip, Mr. Parks made a study of methods used and of how the extension entomologists divided their time in carrying on their work.

During Mr. Parks' absence, Mr. C. F. Smith and Dr. R. H. Davidson carried on the work. Mr. Smith has assisted Mr. Parks for the past few summers.

PROGRAM OF SECTION OF EXTENSION, A. A. E. E.

In the hope of arranging a program for the Section of Extension of the American Association of Economic Entomologists at the annual meetings in Columbus, the extension entomologists met at the time of the North Central States entomologists' meeting last March to consider topics for discussion. It was thought discussion of the many changes that have taken place in agriculture with regard to those that have increased insect problems and to those that assisted in the control of insects would make a desirable

program. Accordingly, this suggestion was submitted to the officers of the Section, and the following program was arranged by George D. Jones, chairman, and J. O. Pepper, secretary. The plan is to have the two main speakers outline the broader phases of the subjects. The discussion to follow will bring out what individuals are doing, and what needs to be done by agricultural workers to relieve the present insect situation. Come prepared to discuss any or all of these topics whether your name appears on the program or not.

Program

Columbus, Ohio, December 28, 1939
1:30 p. m.

George D. Jones, Chairman — J. O. Pepper, Secretary

Subject-Matter Program in Relation to Present-Day Agriculture	J. L. Boatman, Chief, Division of Subject Matter, Extension Service, U. S. Department of Agriculture.
Recent Changes in Agriculture and Their Effect on Insect Problems	Dr. P. N. Annand, Assistant Chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.
A. Effects of Idle and Abandoned Land on Grasshopper Populations	F. Gray Butcher George I. Gilbertson
B. Effects of Strip Farming and Wind Erosion on Grasshopper Populations	O. S. Bare C. B. Dibble
C. The Evaluation of Insect Losses Under the Crop-Insurance Plan	W. P. Flint
D. The Effect of Wheat-Harvesting Machinery on Insect Control	T. H. Parks E. G. Kelly
E. The Effect of Corn-Husking Machinery on Corn-Borer Control	George E. Lehker L. L. Huber
F. Some Effects of Substitute Crops and Rotations on Wireworm Control	R. W. Leiby W. C. Nettles

Program (Continued)

G. Agricultural Adjustments To Meet Japanese Beetle Conditions (illustrated) ..... G. S. Langford

Election of officers.

Adjournment.

GROWTH IN EXTENSION PERSONNEL 1914-39

Under the provisions of the Smith-Lever Act, the Cooperative Extension Service was set up on July 1, 1914, with 1,613 workers. At the beginning of the current year - 1939, there were 8,680 extension workers.

Serving the farmers in the 3,000 counties in the United States and including the agents in Alaska, Hawaii, and Puerto Rico are 4,074 county agricultural agents and their assistants as compared to 881 in 1914.

Working with farm homemakers in these counties is a devoted group of 2,136 home demonstration agents and their assistants, which has developed from the original group of 349 women on the rolls in 1914.

County 4-H Club agents were not employed in 1914, but now 278 men and women are located in the counties to devote their entire time to the work of these clubs.

From a nucleus of 50 Negro extension agents working in the field on July 1, 1914, the number has grown to 504 agents devoting all their efforts to the benefit of the Negro farm family of the South.

To support the work of the county extension agent and keep the machinery running smoothly, 622 administrators and supervisors are required in 1939 as compared to 162 in 1914. In addition, the services of 1,570 subject-matter specialists are now available as compared to 221 in 1914.

EXCERPTS FROM ANNUAL REPORTS

Since this is the season for writing annual reports, the space usually allotted to articles and timely topics has been devoted to additional excerpts from reports. The cover page of this issue deals with annual reports, so it will not be necessary to go into further detail here.

CURRENT CHANGES IN THE STATE EXTENSION PROGRAM IN COLORADO IN RELATION TO THE ENTOMOLOGY PROJECT

The biggest change in the State extension program that has occurred during the past year in relation to this project [entomology] has been the increasing demand for time to be devoted to the grasshopper project. This project, with over 16,000 farm cooperators, is assuming the proportions of a full-time job for one specialist. As a result of the size of the grasshopper project, other entomological projects are receiving less attention.

A State agricultural clearing committee composed of Federal and State officials, representing practically all Colorado agricultural interests, meets once a month. A subcommittee on pests studies the State's pest problems, and through these studies outstanding pest problems are emphasized. This committee, of which the extension entomologist is chairman, has been especially concerned with grasshoppers, prairie dogs, ground squirrels, and rabbits.

As the entomology project becomes better established, demands of county agents and farmers for assistance are increasing. Correspondence has been especially heavy during 1938.

--Colorado Extension Annual Report, Entomology, 1938.

TEXAS

A Thumbnail Sketch

In the plan of work submitted in the spring of 1938, total losses of $79,421,165.97 were revealed. These losses were due to insect attack or failure to follow improved practices, and we considered it our responsibility to bring about a 50-percent reduction of this loss, or an annual sum of $39,767,925.97.

The projects outlined for the year's work were:

1. Cotton flea-hopper control.--The annual loss due to this insect is estimated at $12,000,000 in Texas. Our year's goal was set for intensive dusting of 55,000 acres with a total net saving of $100,000.

2. Cut-ant control.--This insect inflicts a total annual loss of $1,642,755. Through control measures we planned to obtain a saving of $100,000.

3. Ox-warble control.--This pest causes in Texas annual losses in flesh and reduction in milk flow estimated at $1,947,960. Control work was begun in 1936, and results showed that under certain conditions, it was practical and profitable. Further work in 1937 showed even more definite results; on one ranch where the animals on a solid 10-section area were

treated, observation in 1938 showed a high percentage of reduction of grubs that season as a result of the work of the year previous.

4. Grasshopper-egg survey --The normal annual Texas loss from grasshoppers is estimated at $1,000,000. Our plans were by demonstrations and otherwise to obtain as nearly complete control as possible of an infestation that threatened a $20,000,000 loss.

5. Training junior entomologists.--Our plan was to carry out this work in selected counties in the State, and give a limited number of selected club members an elementary knowledge of insects, so that in as many communities as possible boys with sufficient knowledge and training could advise the county agent concerning sporadic insect outbreaks and aid him in a control campaign.

--Texas Extension Annual Report,
Entomology, 1938.

GOALS AND RESULTS

Kansas
Livestock Insect Work

Work planned	Work accomplished
1. To have 25 counties adopt this subproject as a major project.	1. Twenty-five counties adopted this subproject.
2. To have 78 counties adopt this subproject as a minor project.	2. The 78 counties that adopted this subproject as a minor received aid by correspondence.
3. To hold 5 tours or field days.	3. Two tours on livestock insects were held.
4. To hold 25 leader-training meetings.	4. Fifty-six leader-training meetings were held.
5. To have 20,000 farmers and stockmen practicing approved methods.	5. A total of 18,922 farmers and stockmen practiced approved methods for the control of livestock insects.

--Kansas Extension Annual Report,
Entomology, 1938.

Missouri

1. Goal.--Develop and suggest county agent project plans for insect-control work for all counties in the State. Suggest ways in which work can be coordinated with other project work.

Result.--Every county in the State had an insect control committee and worked on one particular insect or another. In many counties the township leaders planned and carried out large-scale insect-control work which dealt with problems regarding several crops as well as livestock. * * *.

2. Goal.--Organize in all counties (114) a county insect-pest-control committee and select township leaders in all counties.

Result.--Township leaders were selected and formally appointed by Governor Stark in 114 counties of the State. There were 1,300 such leaders.

3. Goal.--One hundred fourteen counties carrying some part of a definite project on insect control work.

Result.--One hundred seven had grasshopper bait-mixing stations or were set up to use Federal bran if needed. The other seven counties had insect-control organizations and organized and carried out certain insect control projects. Grasshoppers were not a problem in these counties.

4. Goal.--Assist with Statewide conferences and district county agent meetings, held to adopt proper control measures and prepare timely control suggestions for the agents during the year.

Result.--A series of Statewide conferences was held with the county agents and insect control suggestions were sent bimonthly to agents during the year.

5. Goal.--Train 1,300 township leaders in insect-control work.

Result.--County training meetings were held in all the counties to train 1,300 leaders.

* * * * * *

25. Goal.--Seventy counties doing garden-insect control work.

Result.--One hundred fourteen agents gave out instructions on garden-insect control. All agents carrying out the garden project also carried out insect control work. Garden and truck-crop insects were abundant this year, and the common bean beetle and cabbage and potato insects were abundant.

26. Goal.--Ten home demonstration agents holding 50 leader-training meetings on household-insect control work.

Result.--Five home demonstration agents organized leader-training meetings in their counties. In Cole County, 15 leaders held meetings.

27. Goal.--One hundred thousand horses and mules in 90 counties treated for bots.

Result.--Reports indicate that about 75,000 animals were treated for bots in 60 counties.

28. Goal--One hundred and fifty farmers in 20 counties dipping 10,000 sheep in the spring and fall for lice and ticks.

Result.--Reports indicate that about 25,000 farmers followed recommendations on insect control for sheep.

* * * * * *

32. Goal.--Thirty counties doing 4-H entomology-club work.

Result.--Thirty-nine counties carried on 4-H entomology-club work with 515 boys and 348 girls enrolled.

33. Goal.--One State 4-H entomology-club contest.

Result.--One contest was held during the annual 4-H Club Round-up at Columbia during August. Teams from Howard, Worth, Chariton, Montgomery, Linn, and Lafayette Counties entered.

--Annual Report, Missouri Extension Entomologist, 1938.

Ohio

Goals set.

(a) To have less than 5 percent of the wheat crop sowed before the safe-seeding dates. (See (a) under "Goals attained.")

(b) To present subject matter about fruit insects and spray practices at 12, or more, fruit schools or meetings.

(c) To have 95 percent, or better, fruit free from insect blemishes in orchard where spray service information was followed.

(d) To have spray-service information reach not less than 9,500 growers in Ohio.

(e) To have at least 60 cooperators whose orchards will be used in checking results of the spray-service recommendations.

(f) To have 8 fruit growers operating codling-moth bait-pans to time the cover sprays.

(g) To reduce the damage now being done by grape berry-moth and other insects in commercial grape-producing areas.

(h) To present subject matter on vegetable-crop insects to at least 12 county-wide vegetable meetings.

(i) To meet and discuss control measures with insecticide dealers.

Goals attained.

(a) This goal was easily reached. Publicity and suitable weather brought this about.

(b) Twelve fruit schools and meetings were served.

(c) This goal not quite attained. Ninety-three percent of the fruit was clean of insect blemishes.

(d) Goal attained - 10,207 fruit growers received the spray-service information.

(e) Goal attained - 78 orchards checked.

(f) Goal attained - 8 such stations were in operation.

(g) Failed utterly, because of the light crop and weather favorable to grape berry-moth.

(h) Seven county-wide meetings were held.

(i) Insecticide dealers of two counties were brought together for meetings.

--Annual Report, Ohio Extension Entomologist, 1938.

PROCEDURE AND TEACHING METHODS IN MICHIGAN

Film strips have always been found extremely useful where groups can be brought together with the proper facilities for their use. A projector and strips are carried at all times and are used wherever possible. Pictures are still being accumulated for use in making new strips. This season's activities in the grasshopper territory provided several new pictures in addition to those collected last year that should furnish some good material for this purpose. An endeavor will be made during the coming season to supplement these with additional material and prepare a film strip that can be used on the subject of grasshoppers as a factor in soil erosion in Michigan.

--Annual Report, Michigan Extension Entomologist, 1938.

ATTENDANCE AT MEETINGS EFFECTED BY ANNOUNCEMENTS

Demonstrations in several counties drew good attendances. A meeting advertised as a "Mexican bean beetle control demonstration" was found to be decidedly more successful than a similar meeting in the same county advertised as a "garden-insect control demonstration."

--Annual Report, Indiana Extension Entomologist, 1938.

4-H ACTIVITIES IN SOUTH DAKOTA

Because of the emergency grasshopper and Mormon cricket control, very little attention could be given to 4-H Club activity. However, the extension entomologist was able to attend the State 4-H conservation camp at Judson in the Black Hills.

An exhibit was shown of harmful and beneficial insects. Two 45-minute talks were made. One afternoon was spent with a part of the group in:

1. Collecting insects.
2. Pinning insects.
3. Making specimen mounts.
4. Keeping records.

As a part of an evening meeting, film strips were used in a talk on insects injurious to livestock.

During the winter of 1938, the extension entomologist assisted County Agent O'Connell, Day County, in training a 4-H demonstration team in grasshopper control. Each member of the team was coached in subject matter and supplied with demonstration material. This team was used in Day and surrounding counties for township meetings. Unfortunately two of the boys moved to other States, so the team was broken up.

This is a phase that should not be neglected, however, as it has great educational possibilities.

--South Dakota Extension Annual Report, Entomology, 1938.

4-H PROJECT IN ENTOMOLOGY

Unusual interest has been shown this year in insect-club work by 4-H girls. Oak Ridge is the leading club in this project in the county. Mrs. Beulah Harmon, their coach, has had advanced training in entomology and is quite interested in the work.

One hundred and eight 4-H girls enrolled in the insect work this year, and 72 of them completed. These girls collected 1,690 insects, and classified 1,226. Of this number 601 were beneficial and 625 were injurious.

During May, a part of the monthly 4-H programs was given to insect control, with demonstrations on "housefly control" and timely topics on "our insect friends." The girls have a total of 26 method demonstrations on this project and entered 5 demonstrations in the county team-demonstration contest.

Eight exhibits were made this year in insect control by 4-H Club girls at the county fair, where they won prizes amounting to $4.50. First-, second-, and third-year exhibits were sent to the State fair at Oklahoma City,

where the first-year exhibit placed ninth; the second-year exhibit, second; and the third-year exhibit, second. These placings won prizes amounting to $5.

Each girl enrolled in the insect club was given Oklahoma Circular No. 333 "4-H Club Insect Manual" from which she received most of her information and instructions in this line of work.--Grady County.

--Annual Report, Oklahoma Extension Entomologist, 1938.

COOPERATION WITH 4-H CLUBS AND FUTURE FARMERS OF AMERICA

A school attended by 15 4-H Club agents and agricultural high-school teachers was conducted at Kingston for the purpose of providing training in the identification of fruit-insect injuries. An exhibit of fruits injured by 25 insects and diseases was displayed and proved very effective in illustrating to the agents the various types of injuries. A lecture on control measures for the different pests was also given.

A field trip attended by 25 agricultural high-school teachers in western New York was held in Wayne County for the purpose of collecting and providing instruction on the identification of fruit and vegetable insects. Six vegetable and fruit farms were visited, insects were collected and identified, damage caused by the various insects was pointed out to the teachers, and control measures were explained. At this time some training was given in the identification of the fruit insects to be included in the junior fruit contests at the horticultural society meeting at Rochester in January.

--Annual Report, New York Extension Entomologist, 1938.

FARM AND HOME WEEK PROGRAM

As part of the program of Farm and Home Week held at Ithaca during February a "clinic" on fruit-insect and disease control was held in cooperation with the department of plant pathology. One hundred twenty-eight farmers attended 40 of these sessions, which were conducted as informal round-table discussions on the various insect and disease problems presented by the farmers. Fruit growers from 31 counties in the State attended. Of the 31 counties, only 6 operate an active spray-information service. This seems to indicate that the needs of growers in the counties operating a spray service are being adequately handled by this method of education. This may be a partial explanation of why we concentrate a good share of our efforts on a special training of the agents in the highly specialized fruit areas.

--Annual Report, New York Extension Entomologist, 1938.

HOME DEMONSTRATION AGENTS AND HOUSEHOLD-INSECT CONTROL

Nearly half of Indiana's 92 counties now have home demonstration agents, none of which has to our knowledge, any entomological training. These agents are called upon from time to time to answer questions covering the control of household pests, and it is imperative, therefore, that they be given assistance in this field.

This work was carried on in 9 counties during the year. Two meetings were conducted in cooperation with Miss Kent, home-economics specialist, as a part of her project work, and 7 were conducted independently with the assistance of the home demonstration agents concerned. These agents were furnished copies of the project and also a procedure outline offering helpful suggestions. Dates were then selected and the meetings announced. Anyone interested was asked to attend, but special invitations were extended to the leaders of local home-economics clubs. Following the meetings, these leaders reported to their clubs, thereby spreading the information to all sections of the counties. Bulletins and other literature were distributed to the leaders for use by members of their clubs.

In this manner approximately 3,000 women were reached by the project last year. One hundred and sixty-one reported the construction of fly traps according to recommended specifications.

--Annual Report, Indiana Extension
Entomologist, 1938.

SCHOOL FOR VEGETABLE GROWERS

Vegetable growers' schools were held in Lake, Marion, Vigo, and Gibson Counties, in which the principal vegetable-growing areas are located. Practical problems of insect control were discussed, and exhibits made of insects, sprayers, dusters, and insecticides. One melon grower in Gibson County had, the year previous, dusted 26 acres of cantaloups with rotenone dust. The material cost 15 cents a pound, and four applications had been made at the rate of 8 pounds per acre. The total cost of the dust applied, therefore, was $124.80. At our suggestion, he used the following year a mixture of calcium arsenate and gypsum at a cost of 2 cents a pound. The same amount of material was applied at a cost of $16.64, effecting a saving of $108.16.

--Annual Report, Indiana Extension
Entomologist, 1938.

EVALUATING SPRAY-SERVICE INFORMATION

Apple growers suffered heavy losses due to attacks of insects in orchards where a definite suppression program was not completed. Spraying information was given in 55 counties to 8,627 orchardists who requested it.

A survey of apple orchards, made annually to ascertain if the recommendations as they may be interpreted and used by the growers, are efficient, indicated that 33.3 percent of the owners had followed the suggestions exactly and 62.2 percent of them either had used some of them or their spraying method was faulty. There were 312 apple orchards examined which provided a dependable cross section of the apple industry. In 104 of them completely sprayed for insects, 96.1 percent of the apples harvested were free from insect injuries. The 15-year average is 94 percent. On the other hand, in 144 orchards not sprayed completely or thoroughly, only 82.7 percent of the apples were free from insect injuries. The records in such orchards cover a 14-year period, the average for which is 79.4 percent.

--Annual Report, Pennsylvania Extension Entomologist, 1938.

CEREAL INSECTS

Request for assistance in fumigation of bins and other storage spaces for grain is on the increase because of the large amount of wheat, oats, and barley stored on Oklahoma farms this year. We have been advised that the elevators are docking the farmers $\frac{1}{2}$ cent to 2 cents a bushel on account of the wheat's being infested with weevils. Mimeographed material has been prepared and sent to all agricultural leaders in the State and to all newspapers, calling this fact to the attention of farmers and telling them that our services are available for educational meetings for the control of stored-grain pests. We plan to do much of this work in 1939.

--Annual Report, Oklahoma Extension Entomologist, 1938.

STORED-GRAIN INSECTS

The writer visited most of the counties during the summer months and discussed with the county agents the insect problems of the county. During these visits, plans were made to hold a number of method demonstrations on the control of insects in stored corn, peas, etc. The specialist assisted with some of these demonstrations and prepared mimeographed material and news articles giving information on the subject. As a result of this work, 9,355 farmers in 65 counties followed experiment-station recommendations for the control of insects in stored grain.

--Annual Report, Alabama Extension Entomologist, 1938.

CATTLE-LOUSE CONTROL

Cattle lice are a problem in South Carolina, and though they might be controlled by dipping early in the fall, this practice has never been

followed. It is therefore apparent that a louse powder, which might be applied dry during the wintertime when lice appear, fills a long-felt need. Several years ago J. R. Hawkins, extension animal husbandman, requested entomologists to supply the formula for a suitable louse powder. When the situation was surveyed, information was found to be rather meager, but, by getting the suggestions from Michigan and from various entomologists with commercial concerns, it was finally decided that the following formula should prove effective:

Item	Pounds
Derris root (5 percent rotenone)	20
Powdered pyrethrum	10
Powdered naphthalene	8
Inert filler (talc, kaolin, or sulphur)	62

During the winter of 1938, over 2,000 head of cattle were treated with this louse powder with satisfactory results. Several insecticide dealers are mixing the powder and supplying it to cattle men.

--Annual Report, South Carolina
Extension Entomology, 1938.

HORSE-BOT CONTROL

Horse-bot control work was conducted through county agents' offices in 24 counties of the State, in which 5,379 farmers participated. The program was conducted much as in the past, with the extension specialist describing recommended procedures before meetings of county agents, and in a few counties before general meetings of horse owners. The township organization was followed, in which all animals were treated by experienced veterinarians as in previous years. Unsatisfactory road conditions prevented completion of all work planned in the various counties, but in general the program was entirely satisfactory, as is indicated by the following reports from county agents:

"The winter of 1937-38 was the third season of bot-control work in Sargent County. In 1934, very little was done in the way of treating horses for bots and that only by individual owners here and there in the county. In 1935-36 the first organization effort was made. At this time the work was carried on on a voluntary basis. The county agent arranged a schedule for a veterinarian in going from farm to farm for those men who asked to have their horses treated. In a few townships almost 100-percent cooperation was obtained, and in others it dropped as low as 50 percent. Some treating was done in all parts of the county. The results obtained in that part of the county where most horses were treated were far better than where only part of the horses were treated, so it was determined in 1936-37 to do a complete job in those townships where the work was carried on at all. The township sometimes agreed to pay part of the cost of treating, and this plan worked out with fair success. In 1937-38, eight townships

cooperated with the county agent's office in having the treating done by a licensed veterinarian. Sargent County has only one licensed veterinarian, and he does considerable work in two adjoining counties and is unable to cover the entire county. However, several other townships carried on a virtually 100-percent bot-control program with local men doing the treating. The results obtained have usually been good, except in cases where farmers had not starved their horses thoroughly before treatment. In a few cases the treating was done too late in the season to be effective."--Sargent County.

"Twenty horse owners treated 120 horses in the winter of 1937-38. This treatment was promoted through news articles, posters, and personal contact.

"Replies to a questionnaire sent to all horse owners in the county in October indicate that 75 percent of those reporting favor a countywide control for 1938, 12 percent are not interested, and 15 percent make no comment. A question included for the past treating reveals that 70 percent found their horses in better condition, and 19 of the 20 that treated in 1937 are willing to treat again.

"A countywide treatment is in progress and will be started the latter part of December."--Adams County.

"A group of horse owners in Buena Vista Township met in December and agreed to have a licensed veterinarian administer the bot treatment to their horses. They selected key stations in the township where the horses would be assembled for the convenience of the veterinarian. D. R. Henderson, one of the farmers, agreed to guide him around the township. The fee charged was 50 cents a horse. That good results were obtained is shown by the fact that many of these farmers have called at the office asking that the same campaign be carried on again this fall. A typical statement was submitted by William Aus. He states, "My horses came through the winter in better condition and made better use of their food. There weren't nearly so many bot flies bothering the horses this summer. We could not expect 100 percent results, because some of our horses were in foal and could not be treated." Sixty-three work horses and six colts were treated."--Bowman County.

--Annual Report, North Dakota Extension
Entomology and Plant Pathology
Specialist, 1938.

HORSE BOTS AND BOT FLIES

This has proved to be a very popular phase of extension entomology during the past 3 years. The carbon bisulphide capsule method of horse-bot eradication has been used exclusively and has proved to be almost 100 percent effective. Where the work has been done by a qualified veterinarian, losses have been negligible. Approximately 10,000 head of horses and mules, in 15 counties, were treated in 1936, and in 1937 this increased to 41,777 head in 63 counties.

A circular on organizing and conducting a horse-bot control campaign was prepared and furnished to all county agricultural agents in 1936. Another circular on horse-bot control was prepared for general distribution. These were used throughout the campaigns of 1936, 1937, and 1938. The work was carried on cooperatively by the extension entomologist, extension animal husbandryman, and extension animal pathologist.

Counties in which interest seemed to be general were organized by precincts or neighborhoods, with a committee of farmers to promote the work in each. Meetings were held where it seemed advisable, and all farmers were contacted and the work explained to them. The county agent supervised the campaign, but the cooperation of the veterinarians was secured, and every effort was made to have all the treatments administered by them. Necessary materials were furnished by the veterinarians or were bought cooperatively at a reduced rate. A definite schedule for the work was made out, and each farmer had his horses and mules ready for the treatment at a specified time. The veterinarian then made the scheduled trip and administered the treatment. Where interest was not general in a county, the work was confined to those localities where interest seemed sufficient to justify it.

Sixty-five counties carried on the work to a greater or lesser degree, and a total of 39,498 horses and mules, belonging to 7,193 farmers, were treated. This was practically double the goal that had been set, and but for the straitened financial condition of many farmers, participation would have been much greater. The average cost was 38 cents per horse, and many farmers felt that the results were worth $5 a head. Only 8 head were reported lost out of the total number treated, this being approximately one out of every 5,000. Every effort was made to discourage treatment by laymen, and it is felt that this was largely responsible for the low mortality rate.

Interest in this work is very good despite the trying financial situation, and the plan is to carry it on in 1939 much as was done in 1938.

--Annual Report, Nebraska Extension Entomologist, 1938.

COOPERATION WITH GOVERNMENTAL AGENCIES

Soil Conservation and the New Farm Act

Suggestions were made to the State committee and county committeemen, whenever they were encountered in connection with the grasshopper control work, with particular reference to the saving of new seedlings from the inroads of grasshoppers by the use of poison-bran bait. It was noted in several instances in 1937 that serious losses occurred to attempted establishments of seedlingswhere grasshoppers were a problem, and as payments were based on a theory of beneficial effects, it seemed desirable to call some attention to the fact that losses of this kind were suffered in many cases due to negligence on the part of the farmer in meeting natural forces, such as prevalence of extremely wet or extremely dry weather.

--Annual Report, Michigan Extension Entomologist, 1938.

Work With W. P A.

One of the outstanding cooperating agencies in grasshopper control was the Works Progress Administration. In all cooperating counties, a W.P.A. project was set up for unloading, mixing, and storage of bait materials. To conduct a campaign as extensive as the 1938 campaign without this labor would have been difficult if not impossible. All these projects were sponsored by the State Extension Service, State College, Brookings, S. Dak.

--Annual Report, South Dakota
Extension Entomology, 1938.

Assistance Given to W. P. A. Garden Instructors

Fifty W.P.A. garden instructors were given insect-control information at a meeting in Indianapolis. The number of persons contacted during the summer by these men is said to have been about 6,000.

--Annual Report, Indiana Extension
Entomologist, 1938.

COOPERATION WITH COMMERCIAL AGENCIES

Ohio

A conference was held with the salesmen of a commercial oil company operating in Ohio, when the subject of Oil Sprays and Their Place in the Ohio Spray Program was discussed.

Circular letters were sent to all the commercial tree-spray operators whose addresses could be obtained, for the purpose of instructing them regarding canker worms and other shade-tree pests.

--Annual Report, Ohio Extension
Entomologist, 1938.

Oklahoma
Work With Insecticide dealers

Slowly we are getting the stores that handle insecticides to stock a larger variety. Formerly they stocked only paris green, arsenate of lead, and nicotine sulphate. We are attempting to get the stores to carry a complete line of insecticides, especially some product that contains rotenone and also the gypsum-calcium arsenate mixture. A few farm women's clubs have ordered the insecticides as a group through their local dealer, which has not only increased his business but has also saved the club members' money.

--Annual Report, Oklahoma Extension
Entomologist, 1938.

Indiana

Work With Insecticide Dealers

More than 50 dealers attended the insecticide dealers' conferences in Indiana. The merchants themselves estimated that they sold insecticides to an average of 500 people each year. Therefore, a potential 25,000 persons may be benefited by the conferences held to date. In each of the 17 counties having representatives at these meetings, the county agents report that all insecticides recommended by the extension department are now available in at least one store.

--Annual Report, Indiana Extension Entomologist, 1938.

Dealers Treat Plants for Cabbage Aphids

In Dubois County all dealers in cabbage plants were contacted and persuaded to dip their plants in a nicotine sulphate solution at the time of sale as a means of controlling plant lice. As a result, the county agent reported only one complaint of cabbage aphids this year and estimated a saving to the farmers of $7,000.

--Annual Report, Indiana Extension Entomologist, 1938.

New York

Insecticide Dealer Cooperation

In June the extension entomologist addressed by invitation a conference of 35 dealers in insecticides operating in this State when two talks were made on vegetable insects and the proper insecticides to use for their control. These talks resulted in assurance that the State-wide agricultural service organization marketing insecticides extensively, would make every effort to see that its stock is fresh, properly labeled, and sold for the proper insect control. This was a definite and much desired assurance.

--Annual Report, New York Extension Entomologist, 1938.

Increased Sales Help to Evaluate Work

The campaign to promote the increased use of dusters is meeting continued success. One company in Indiana manufacturing these appliances reports a 25 percent increase in Indiana sales over those last year, and a Chicago concern has had a 15 percent increase in sales.

--Annual Report, Indiana Extension Entomologist, 1938.

MARYLAND PUBLICATIONS

Maryland Extension Service circulars.

No. 127. How to repel the Japanese beetle by spraying. S. L. Crosthwait. February 1938.

No. 128. Protect your lawn from Japanese-beetle injury. S. L. Crosthwait. February 1938.

No. 129. Trapping the Japanese beetle. S. L. Crosthwait. February 1938.

Fight the Japanese beetle. Here's how.

Maryland spray calendar for apples and peaches for 1938.

Spray cards for peaches and apples.

Journal articles.

Are you going to raise apples next year? Earnest N. Cory. Peninsula Horticultural Society. Trans. 75 (1937). pp. 107-110.

The Japanese-beetle retardation program in Maryland for 1938. S. L. Crosthwait. 1937. Peninsula Horticultural Society. Trans. pp. 137-139.

The program for Japanese-beetle retardation in Maryland for 1938. George S. Langford. Maryland State Horticultural Society Proc. 40 (1938). pp. 28-34.

Resume of Japanese-beetle retardation work in Maryland for 1938. George S. Langford. Peninsula Horticultural Society. Trans. 52 (1938). pp. 118-120.

Practical aspects of pea-aphid control. L. P. Ditman. Peninsula Horticultural Society. Trans. 52 (1938).pp. 136-141.

Dormant spray for peaches. C. Graham and R. A. Jehle. Maryland Fruit Grower. v.8.,no. 11., pp. 1-2. Nov. 1938.

Mimeographed material.

Control of tobacco insects. Ernest N. Cory. March 1938.

How to control the Mexican bean beetle. Ernest N. Cory. March 1938.

Termites and their control. Ernest N. Cory. April 1938.

Control of the oystershell scale. Ernest N. Cory. May 1938.

Control of the gladiolus thrips. Ernest N. Cory. May 1938.

The common mole of eastern United States. Scalopus aquaticus. Ernest N. Cory. May 1938.

Schedule for the control of rose pests. Ernest N. Cory. May 1938.

Methods and materials for the control of some house pests. Ernest N. Cory. June 1938.

Dusters and dust mixtures. Ernest N. Cory. March 1938.

Some problems facing the fruit grower. C. Graham. November 1938.

Control of grain insects. Ernest N. Cory. October 1938.

Chrysanthemum pests. Ernest N. Cory. November 1938.

Alder blight aphid on maples. Ernest N. Cory. July 1938.

Abstract of Japanese-beetle work in 1938. George S. Langford.

Summary of Japanese-beetle work in 1938. George S. Langford.

--Annual Report, Maryland Extension Entomologist, 1938.

LOOKING FORWARD

Cooperation with horticultural and commercial agencies will be continued. More emphasis will be placed on properly informing retail insecticide dealers and aiding them in purchasing the most acceptable materials for sale. We find them willing and eager better to serve their purchasers.

Plans are already under way for training local crop-loss appraisers working under the new Agricultural Adjustment Act. These men are responsible for adjustments of insect losses to staple crops and for fumigation of grain sealed under the farm storage plan.

We regret not being able to work more with the juniors and especially with the 4-H groups, but cannot enlarge this very much unless it be at the expense of established insect-control projects.

As we look back over 1938, again we are not satisfied with the accomplishments. Our projects affect industry as well as agriculture, and our services are sought by people in all walks of life, since insects are no respectors of persons. Our aim will be to give prompt attention to all requests received and to advance our projects toward the goals set. We anticipate a busy year during 1939.

--Annual Report, Ohio Extension Entomologist, 1938.

STATISTICAL SUMMARY

C. F. Stiles

Days in field	137
Days in office	153
Number of letters written	1,516
Miles traveled by auto	21,393
Home demonstration agents visited	50
Days spent with home demonstration agents	56
County agents visited	168
Days spent with county agents	126
Total visits made to:	
Northwest district	61
Southwest district	47
Northeast district	31
Southeast district	39
Total number of meetings held	130
Total attendance at meetings	3,864

--Annual Report, Oklahoma Extension Entomologist, 1938.

PUBLICATIONS

ARKANSAS

Biologies of Arkansas rice field mosquitoes. H. H. Schwardt. Ark. Agr. Expt. Sta. Bul. 377. Fayetteville. 1939.

Timing seasonal occurrence and abundance of the codling moth. D. Isely. Ark. Agr. Expt. Sta. Bul. 382. Fayetteville. 1939.

INDIANA

Why some growers fail and others succeed with the same apple spray program. C. L. Burkholder and G. E. Lehker. Ind. Agr. Expt. Sta. Cir. 241. Lafayette. 1939.

MARYLAND

The production and marketing of honey in Maryland. R. F. Burdette and S. H. DeVault. Md. Agr. Expt. Sta. Bul. 427. College Park. 1939.

MINNESOTA

Insects infesting stored foods. H. H. Shepard. Minn. Agr. Expt. Sta. Bul. 341. University Farm, St. Paul. 1939.

MISSOURI

Controlling the fruit-tree leaf roller. L. Haseman and H. E. Brown. Mo. Agr. Expt. Sta. Cir. 203. Columbia. 1939.

Spraying apples for the prevention of fruit set. P. H. Shepard. Mo. Fruit Sta. Cir. 28. Mountain Grove. 1939.

NEW JERSEY

New Jersey mosquito larvicide. J. M. Ginsburg. N. J. Agr. Expt. Sta. Cir. 382. New Brunswick. 1939.

Control of the Japanese beetle on ornamental plants. C. C. Hamilton. N. J. Agr. Expt. Sta. Cir. 387. New Brunswick. 1939.

Controlling house plant pests. C. C. Hamilton. N. J. Agr. Expt. Sta. Cir. 388. New Brunswick. 1939.

Dormant season spraying, trees and shrubs. C. C. Hamilton. N. J. Agr. Expt. Sta. Cir. 389. New Brunswick. 1939.

Some common beetles on roses and other flowering plants. C. C. Hamilton. N. J. Agr. Expt. Cir. 390. New Brunswick. 1939.

NORTH DAKOTA

Insect pests of trees and gardens. J. A. Munro. N. Dak. Agr. Col. Ext. Special Cir. Fargo. February 1939.

OKLAHOMA

Control of shade-tree borers. F. A. Fenton. Okla. Agr. Expt. Sta. Cir. 84. Stillwater. 1939.

SOUTH CAROLINA

The Mexican bean beetle in South Carolina. F. Sherman and J. N. Todd. S. C. Agr. Expt. Sta. Bul. 322. Clemson. 1939.

WYOMING

The cellar wintering of bees. C. H. Gilbert. Wyo. Agr. Expt. Sta. Bul. 234. Laramie. 1939.

UNITED STATES DEPARTMENT OF AGRICULTURE

The Black Hills beetle, a serious enemy of Rocky Mountain pines. J. A. Beal, Bureau of Entomology and Plant Quarantine. F. B. 1824. 22 pp., illus. 1939.

Elm bark beetles. T. H. Jones, Bureau of Entomology and Plant Quarantine. Leaf. 185. 8 pp., illus. 1939.

Status and relative importance of the parasites of the hessian fly in the Atlantic States. C. C. Hill, J. S. Pinckney, and E. J. Udine, Bureau of Entomology and Plant Quarantine. Tech. Bul. 689. 15 pp., illus.

Control of cyclamen and broad mites on gerbera. Floyd F. Smith, Bureau of Entomology and Plant Quarantine. Cir. 616. 15 pp., illus. 1939.

Toxicity of certain organic insecticides to codling moth larvae in laboratory tests. E. H. Siegler, F. Munger, and L. E. Smith, Bureau of Entomology and Plant Quarantine. Cir. 523. 10 pp. 1939.

4-H Club insect manual. M. P. Jones, Extension Service. Misc. Pub. 318. 63 pp., illus. 1939.

Taxonomy of some scale insects of the genus Parlatoria encountered in plant quarantine inspection work. Harold Morrison, Bureau of Entomology and Plant Quarantine. Misc. Pub. 344. 34 pp., illus. 1939.